

1917, and January, 1918, opposite departures were the rule. It will be noted further that during the past two months there was a general deficit in air weight over the Aleutian Islands and Alaska, and it followed therefore that few pronounced areas of high barometer formed in that region and moved southeastward over the United States. Consequently, the temperature was generally above the normal, cold waves were infrequent, and heavy falls of snow and sleet confined to small areas. During the corresponding months in the winter of 1917-1918, there was a marked excess of air weight over Alaska and the Aleutian Islands, and it followed that there was a more or less constant drainage of cold air from these regions southeastward over the United States. The result was a succession of widespread cold waves, frequent and widespread falls of snow and sleet, and a general intensification of winter weather conditions in the United States. Attention is invited to a consideration of the charts of tracks of high and low pressure areas across the United States, published in this number of the REVIEW and also those of December, 1918, and December, 1917, and January, 1918. These will show the marked dissimilarity in the types of cyclones and anticyclones during these months.<sup>2</sup>

During the current month nearly all Lows crossing the United States were of the North Pacific and Alberta types; they passed rapidly eastward along the northern border. The only exceptions to this statement were two Lows that formed over southern Texas and another that passed inland from the Oregon coast, moved thence southeastward to the mouth of the Rio Grande and from that region northeastward to the Canadian Maritime Provinces. In respect to HIGHS, none appeared over the western Canadian Provinces; four passed inland from the Pacific Ocean and eight made their appearance north of the Great Lakes or in the region of Manitoba, and of these one passed southward over the Middle West and the others passed eastward and southeastward to the Atlantic coast.

#### NORTH ATLANTIC OCEAN.

By F. A. Young.

On account of war conditions the number of weather reports from the ocean was greatly reduced during the past year and the data available for the usual monthly discussion that should have been prepared for January, 1918, are too incomplete to justify an attempt at the present time to summarize. Instead, a short review of the weather for the current month has been prepared from the data so far received. It is necessarily incomplete, particularly for the latter part of the month, for which few reports are yet available.

On the 1st and 2d two vessels in the region between latitude 47° and 50° and longitude 30° and 33°, experienced strong northwesterly gales, with accompanying barometric readings of 29.72 inches and 30.07 inches, respectively, no other gale reports being received for these dates.

On the 3d the general conditions were very much the same as on the two previous days, except that there was a slight fall in the barometer readings. On the 4th and 5th moderate gales were recorded by a few vessels in widely scattered parts of the ocean.

According to the reports received the heaviest weather of the month occurred on the 6th (Chart IX); the center of the principal disturbance on that date was apparently about 10° west of the Irish coast, and northwesterly gales of from

60 to 90 miles an hour, with a minimum barometric reading of 28.67 inches, accompanied by "hail" and snow, were encountered by a number of vessels at short distances south of the center, the storm apparently covering the greater part of the steamer lanes, as far west as the 40th meridian. On the same day moderate gales, with rain and snow, were also reported in the region between latitude 37° to 41°, and longitude 63° to 66°. On the 7th the center of the European disturbance was apparently off the southwest coast of Ireland, which was swept by gales of over 60 miles an hour, the lowest barometric reading being 28.63 inches. The storm area had contracted considerably since the day before, as no high winds were reported west of the 27th meridian.

On the 8th, 9th, and 10th no well-defined area of low pressure could be determined, although storm reports were received from vessels in all parts of the steamer lanes.

On the 11th two vessels located near latitude 55°, longitude 42°, and latitude 49° and longitude 38°, respectively, encountered westerly gales of over 60 miles an hour, with "hail" and snow, and a barometer reading of 28.98 inches at the first position, probably not far from the center of the Low. At the same time moderate westerly gales occurred in the region between Nova Scotia and the 40th parallel, while snow was reported at Halifax.

On the 12th (Chart IX) the entire territory between the 40th and 53d parallel, and the 30th meridian and the American coast, was swept by westerly and southwesterly gales of from 40 to 75 miles an hour, accompanied by snow. The center of this disturbance had apparently moved about 7 degrees eastward since the previous day, and was now near latitude 52, longitude 35. The conditions on the 13th and 14th and 15th, were similar to those of the 12th, and the Low was evidently drifting slowly eastward, as on the 15th it was somewhere between the 25th meridian and the coast of Scotland.

On the 16th and 17th moderate gales were reported over different sections of the ocean, particularly between the 40th meridian and the Azores.

From the 18th to 21st, heavy weather still prevailed over the greater part of the steamer lanes, and on the 19th and 20th the storm area extended unusually far south, as winds of over 50 miles an hour were recorded in the region between the 35th and 40th parallel and the 52d and 56th meridians.

On the 22d a vessel near latitude 58, longitude 22, encountered southerly winds of about 50 miles an hour. No reports were received for the 23d, and on the 24th (Chart IX) there was apparently a well developed Low central near latitude 38, longitude 68; strong northerly gales swept the coast between Hatteras and the Virginia Capes, and equally strong westerly and southerly winds were encountered over the southern and eastern quadrants of the storm area. No additional storms were reported until the 30th when one vessel near latitude 38, longitude 71, encountered a northwesterly gale of about 65 miles an hour, and a second report was received from near latitude 48, longitude 33, indicating westerly winds of the same force.

#### NOTES ON WEATHER IN OTHER PARTS OF THE WORLD.

##### BRITISH ISLES, JANUARY 1919.

With many cyclones passing over the British Isles, January precipitation was 155 per cent of normal in England and Wales, 122 in Ireland, and 94 in Scotland. Heavy snowstorms occurred January 3-4, and 27.—Sym. Met. Mag., Feb. 1919.

<sup>2</sup> Cf. also P. C. Day, *ibid.*

## NEW ZEALAND WEATHER FOR PAST YEAR.

By ALFRED A. WINSLOW, American Consul-General.

[Dated: Auckland, New Zealand, Jan. 6, 1919.]

The rainfall at Auckland was about 55 inches for 1918, of which less than 5 inches fell during November and December, as compared with 74½ inches for 1917 and

67½ for 1916; while the winter was exceptionally cold, and the present spring and summer to date have been the coolest for many years, and frosts and snowfalls have been quite common in different parts of the islands until recently, to the detriment of grain and fruit crops, young lambs and shorn sheep, and country life in general.

## DETAILS OF THE WEATHER IN THE UNITED STATES, JANUARY, 1919.

## CYCLONES AND ANTICYCLONES.

By A. J. HENRY.

The weather in the United States may be summarized in a single paragraph as follows: The normal winter LOW of Alaska was moderately well developed and extended at times southeastward, overspreading British Columbia and the Canadian northwest. This development in conjunction with a general increase in pressure over middle latitudes, most pronounced in the mountain regions of Colorado, Utah, Idaho, and Wyoming, had a tendency to increase the gradient for south to west winds along the northern boundary of the United States. It also appears that associated with this pressure distribution there was a preponderance of LOWS of the north Pacific and Alberta types, moving rapidly eastward along the northern border of the United States. The following-named exceptions may be noted: Two LOWS, which first appeared over southern Texas, moved thence east-northeast, and a third LOW passed inland over Oregon, moved thence southeastward to the mouth of the Rio Grande, and thence northeastward to the Canadian Maritime Provinces. In respect to HIGHS, four passed inland from the Pacific and eight first appeared north of the Great Lakes or in the Province of Manitoba, and of these one passed southward over the Middle West, the remainder passing eastward and southeastward to the Atlantic. (See Charts II and III.)

The leading feature of the month was, of course, the mild temperature experienced, especially in some portions of the Northwest where the month as a whole was among the warmest of record and in striking contrast to that of January, 1918.

## THE WEATHER ELEMENTS.

P. C. DAY, Climatologist and Chief of Division.

[Dated: Weather Bureau, Washington, Mar. 1, 1919.]

## PRESSURE AND WINDS.

The distribution of the mean atmospheric pressure over the United States and Canada, and the prevailing direction of the winds for January, 1919, are graphically shown on Chart VII, while the means at the several stations, with the departures from the normal, are shown in Tables I and III.

The pressure distribution for the month was marked by two unusual features—first, the almost constantly maintained HIGH over the Plateau region; and, second, the equal persistence of shallow LOWS along the northern border. As a result the average for the month was well above the normal over the entire region from the Rocky Mountains westward, and from the central Plains eastward to near the Atlantic coast, the center of the highest pressure being maintained in the Middle Plateau.

Over the whole of Canada, as far as observations indicate, the pressure was low throughout the month, the negative departures being quite large in the Northwest Provinces. In the United States pressure averaged below the normal over all northern districts from the Missouri

Valley eastward, and along the Atlantic coast to southern Florida.

The general tendency of high pressure toward the south favored winds with strong southerly components over most central and northern districts, while along the southern borders there was a pronounced tendency to winds with northerly components. Over the Middle Plateau the winds maintained the distinctive type present in anticyclones, and were mainly outward from the center of highest pressure. The effects of these winds upon the temperature is clearly apparent on Chart No. IV, departure of the mean temperature from the normal.

## TEMPERATURE.

At the beginning of the month abnormally warm weather prevailed east of the Mississippi River, but temperatures were about 20° below the normal in practically all western districts, with readings below zero as far south as the Texas Panhandle, and also over the Rocky Mountain and Plateau regions. This western cold wave overspread eastern localities during the next few days, and the line of freezing temperature extended well into Florida by the morning of the 4th. Warmer weather followed, although the temperature continued somewhat below the normal until the latter part of the first decade in most sections.

During the second decade, moderate temperatures prevailed in the northern and central districts east of the Rocky Mountains, but temperatures below the seasonal average continued in the central and southern Rocky Mountain and Plateau districts, and in other portions of the South. The third decade was marked throughout by abnormally warm weather in the North, and by moderate temperature in most other districts, although in the southern Plateau and Rocky Mountain regions and the Gulf States temperature continued generally below the normal until near the end of the month. During the closing days temperatures were near the normal almost everywhere throughout the country.

While January as a whole was unusually warm over all central and northern districts, being one of the warmest of record in portions of the far north, and remarkably free from even moderate cold periods, nevertheless over small areas in the southern Rocky Mountain and Plateau regions the month as a whole was unusually cold. This was particularly noticeable in southeastern Utah and the adjacent portions of Arizona, New Mexico, and Colorado, where the prevailing clear weather and general snow cover left over from the heavy falls of the early part of the winter favored intense night radiation. As a result minimum temperatures were unusually low throughout the entire month, and the average temperatures were locally among the lowest of record. (See note in a later REVIEW).

## PRECIPITATION.

The month opened with snow in the northern and rain in nearly all central and southern districts east of the Mississippi River, and also in the west Gulf States,